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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,431	11/09/2001	Peter S. Shifflett	P 5340.11008	8941

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EXAMINER

SUNG, CHRISTINE

ART UNIT PAPER NUMBER

2878

DATE MAILED: 08/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/039,431

Applicant(s)

SHIFFLETT ET AL.

Examiner

Christine Sung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 November 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement filed April 4, 2002 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because The Lockheed Palo Alto Research references lack a publication date. It has been placed in the application file, but the information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-5, 8, 9, 14-17 and 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stedman et al. (US Patent 5,489,777) in view of Goldenberg et al. (US Patent 6,061,141).

Regarding claims 1-5, 8, 9, 14-17 and 20-23 Stedman et al. discloses an apparatus and method for remotely sensing the amount of pollutant in the exhaust plume of a vehicle comprising:

An ultraviolet light source for propagating UV light through the exhaust plume (Figure 1, element 12);

An output lens (Figure 1, element 14) for collimating the ultraviolet light from the ultraviolet light source before it propagates through the exhaust plume;

An IR light source for propagating IR light through the exhaust plume;

An ultraviolet light spectrometer (Figure 11, element 55) for receiving said UV light after it has passed through the exhaust plume of a vehicle and producing a nitric oxide signal representative of the amount of absorption of the UV light by nitric oxide (see column 11, lines 28-43);

An IR detector (element 35) for receiving the IR light after it has passed through the exhaust plume of a vehicle and producing an IR signal representative of the amount of absorption of IR light by the exhaust plume, representing the amount of carbon dioxide in the exhaust plume (See column 7, lines 24-35); and

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A processor (element 15), responsive to said UV signal and IR signal for determining the relative amount of said hydrocarbons, selected nitric oxide, carbon dioxide and carbon monoxide in the exhaust plume (see abstract).

Stedman et al. does not disclose that the UV light spectrometer produces a hydrocarbon signal representative of the amount of absorption of the UV light by selected hydrocarbons in the vehicle exhaust plume. Goldenberg et al. discloses that it is well known in the art that different gases, i.e. hydrocarbons, have spectral signatures at different spectral ranges. Hydrocarbons, for example, have main absorption peaks both in the UV and IR spectral ranges. Further Goldenberg et al. discloses that any of the main absorption peaks of any vapor can be analyzed. Stedman also discloses that any of the following gases may be analyzed by a sensor generating a signal indicative of the absorption of the beam in a wavelength band indicative of corresponding exhaust gases including hydrocarbons. Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used the invention as disclosed by Stedman et al. to detect certain hydrocarbons present in an exhaust plume using UV light with the right spectral range. Using IR or UV to detect hydrocarbons would only be a matter of design choice because both types of light will produce hydrocarbon absorption peaks that will quantify the relative concentration or amount of hydrocarbons present in the exhaust plume.

Regarding claim 2, Stedman discloses an adjustable mirror (Figure 11, element 34) for focusing the UV and IR light that has passed through the exhaust plume and for focusing the light onto the spectrometer (see column 6, lines 31-46). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a lens in

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place of a focusing adjustable mirror as the overall function of the element remains unchanged and lenses are well known for this function.

Regarding claim 16, Stedman further discloses in figure 1, element 11, a light source that is made of a UV and IR light source and a device for collimating the light beams into a combined collimated beam (column 4, lines 62-66) for propagation through the exhaust plume. Although Stedman does not specify the use of a beam splitter or the use of an output lens, he does disclose a general device for collimating and combining the UV and IR light sources. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used such elements such as a beam splitter and lens to collimate and combine different light sources and focus said light sources to a desired direction, since such elements are widely used and well known in the art for that purpose.

Regarding claim 17, Stedman discloses an adjustable mirror or input lens (as disclosed in the abovementioned paragraphs), and an input beam splitter (element 38) for receiving light from the input lens and splitting the light into a UV component (element 40) directed to the UV spectrometer and a IR component (element 42) directed to the IR detector (see figure 11).

5. Claims 6, 7, 10-13, 18, 19 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stedman et al. (US Patent 5,489,777) in view of Goldenberg et al. (US Patent 6,061,141) and further in view of Nelson (US Patent 5,877,862).

Regarding claims 6, 7, 10-13, 19 and 24 the limitations of set forth in claims 4, 9, 1, 14 and 23 respectively, have been described in the abovementioned paragraphs. Stedman in view of Goldenberg does not specifically disclose the use of a tunable IR light or laser to determine the amount of carbon dioxide or carbon monoxide present in the exhaust plume. Nelson discloses a

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tunable laser for measuring the exhaust gases from a vehicle, which is tunable over a range that includes a wavelength corresponding to an absorption line of a pollutant to be analyzed.

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have used a tunable laser or light source in order to offer a remote sensing configuration with greater sensitivity and selectivity.

Regarding claim 18, Stedman in view of Goldenberg discloses the limitations set forth in claim 17, but does not specifically disclose the use of a retroreflector to reflect the light emitted and passed through the exhaust plume onto the input lens and detector. Nelson discloses using a retroreflector (element 20) for reflecting the beam that has passed through the plume of exhaust back towards the detector for detection and the function of the retroreflector is to direct the beam to a desired location. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have used such a detector, if it is desired to direct the beam in a direction directly opposite of the input beam, since it involves only repositioning an element which is considered to be an obvious matter of design choice.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. US Patent 6,560,545-this reference discloses a system and method for remote analysis of exhaust plumes, using both UV and IR radiation.

b. US Patent 6,455,851-this reference discloses a system for monitoring exhaust emissions using both UV and IR radiation.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Sung whose telephone number is 703-305-0382. The examiner can normally be reached on Monday- Friday 7-4 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 703-308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-0956 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

CS
August 5, 2003


DAVID PORTA
SUPERVISORY PATENT EXAMINER
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